

REMARKS

Claims 1-2 and 4-6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa et al. (U.S. Patent No. 6,621,550) in view of Yamada et al. (U.S. Reissued Patent No. RE38,288 hereinafter Yamada '288) and Grupp et al. (U.S. Patent No. 6,449,028).

In response, Applicant amended the independent claims to define the alignment regulate layer as having a thickness less than the thickness of the liquid crystal layer, and respectfully traverses the rejection as it applies to the amended claims.

Arakawa is directed to a liquid crystal display device that has a pair of substrates 1 and 2 mounted together with a predetermined gap therebetween, with liquid crystal 4 provided in the gap between the substrates. (See FIG. 1). Arakawa teaches a counter electrode 5 is coated with an alignment film for vertical alignment, and a surface of a quarter wavelength plate layer 8 is also coated with an alignment film for vertical alignment. (See col. 3, lns. 58-65). However, Arakawa is silent regarding a thickness of the alignment film relative to a thickness of the liquid crystal layer (i.e., a thickness of the gap between the substrates 1 and 2). Moreover, Arakawa fails to show the alignment films in the drawings. (See col. 3, ln. 58).

Yamada '288 is merely directed to a liquid crystal display with a display medium layer sandwiched between a TFT substrate and a counter substrate 13. A display medium layer 14 includes resin walls 16 and liquid crystal regions 17. With respect to Yamada '288, the Examiner asserts on page 3, lines 4 et seq. of the Office Action that Yamada '288 discloses a liquid crystal display panel in which a liquid crystal into which an

alignment control agent is added is filled between a pair of substrates and an alignment regulate layer is formed on liquid crystal side surfaces of the pair of substrates respectively by causing alignment control agent to adhere thereon. (See FIG. 1 of Yamada '288, col. 9, lns. 13-15 and 41-62). Accordingly, the Examiner asserts that one skilled in the art would add the alignment control agent to the liquid crystal material between a pair of substrates and form the alignment regulate layer.

However, the resin wall 16, which the Examiner equates to the alignment regulate layer of the present invention, has a thickness that is greater than a thickness of the liquid crystal layer. Therefore, even assuming that one could combine Yamada '288 with Arakawa, the combination would result in "alignment regulate layer" having a thickness that is greater than a thickness of the liquid crystal layer, contrary to the amended claims.

Grupp is cited by the Examiner as showing an alignment regulate layer corresponding to polymer spacers 8 that have a regulation power for aligning the molecules of liquid crystal vertically to the substrate surface. (See FIG. 2). However, the polymer spacers 8 fail to have a thickness that is less than a thickness of the liquid crystal layer 4. Therefore, Grupp fails to overcome the deficiencies of Yamada '288 and Arakawa as applied to the amended claims.

In contrast, as shown in FIG. 4 of the present application, an alignment regulate layer 25 has a thickness which is less than the thickness of the liquid crystal layer 30. Since the cited references fail to disclose or suggest this feature, for the reasons provided above, withdrawal of the §103(a) rejection of claims 1-2 and 4-6 is respectfully requested.

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Yamada '288 and Grupp, and further in view of Nam et al. (U.S. Pub. No. 2002/0039160 A1). Applicant respectfully traverses the rejection for the reasons recited above with respect to the rejection of independent claim 1.

Since claim 3 depends upon claim 1, and necessarily includes all the features of its associated independent claim plus other additional features, thus, Applicant submits that the §103 rejection of claim 3 has also been overcome for the same reasons mentioned above to overcome the rejection of independent claim 1. Applicant respectfully requests that the §103 rejection of claim 3 also be withdrawn.

Claims 7 and 10 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Yamada '288 and Grupp, and further in view of Shibahara (U.S. Pub. No. 2002/0008836 A1). In response, Applicant amended independent claim 7 similar to independent claim 4, and traverse this rejection as it applies to the amended claim for the reasons recited above with respect to the §103 rejection of claims 1-2 and 4-6.

Shibahara is merely cited by the Examiner as disclosing column-like spaces for maintaining an interval between the pair of substrates constant. Shibahara fails to disclose or suggest an alignment regulate layer having a thickness less than a thickness of a liquid crystal layer, as now recited in amended claim 7. For this reason, withdrawal of the §103 rejection of claim 7 and its dependent claim 10 is respectfully requested.

Claims 8, 11 and 12 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Yamada '288, Grupp, and Shibahara, and further in

view of Sawasaki et al. (U.S. Pub. No. 2001/0026347 A1). Applicant traverses the rejection of claim 8 for the same reasons recited above with respect to the rejection of independent claim 7. With respect to claim 11, Applicant amended the claim similar to claim 1, and traverses the rejection of claims 11-12 for the reason recited above with respect to the §103 rejection of claims 1-2 and 4-6.

Sawasaki is merely cited by the Examiner as disclosing spacers 25a and developing a photoresist 25 in order to have a uniform height to maintain a cell gap constant over an entire display region, which improves display quality. Sawasaki fails to disclose or suggest have a thickness or an alignment layer less than a thickness of a liquid crystal layer. Since Sawasaki does not overcome the deficiencies of the other cited references, Applicant respectfully requests withdrawal of the §103 rejection of claims 8 and 11-12.

Claims 13-16 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Arakawa in view of Yamada '288 and Grupp, and further in view of Yamada '318. (U.S. Patent No. 5,729,318). Applicant respectfully traverses the rejection for the reasons recited above with respect to the rejection of independent claims 1, 4, 7 and 11.


Yamada '318 is merely cited by the Examiner as disclosing the liquid crystal is a liquid crystal composition that includes fluorine. Since Yamada '318 does not overcome the deficiencies of Arakawa, Yamada '288 and Grupp, withdrawal of the §103(a) rejection of 13-16 is respectfully requested.

For all of the foregoing reasons, Applicant submits that this Application is in condition for allowance, which is respectfully requested. The Examiner is invited to contact the undersigned attorney if an interview would expedite prosecution.

Respectfully submitted,

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